

## Investigating the Potential Range Expansion of the Vector Mosquito *Aedes aegypti* in Mexico with NASA Earth Science Remote Sensing Results

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In tropical and sub-tropical regions, the mosquito *Aedes aegypti* is the major vector for the virus causing dengue, a serious public health issue in these areas. Through ongoing NSF- and NASA-funded studies, field surveys of *Aedes aegypti* and an integrated modeling approach are being used to improve our understanding of the potential range of the mosquito to expand toward heavily populated high elevation areas such as Mexico City under various climate change and socio-economic scenarios. This work serves three primary objectives: (1) Employ NASA remotely-sensed data to supplement the environmental monitoring and modeling component of the project. These data -- for example, surface temperature, precipitation, vegetation indices, soil moisture and elevation -- are critical for understanding the habitat necessary for mosquito survival and abundance; (2) Implement training sessions to instruct scientists and students from Mexico and the U.S. on how to use remote sensing and implement the NASA SERVIR Regional Visualization and Monitoring System; (3) Employ the SERVIR framework to optimize the dissemination of key project results in order to increase their societal relevance and benefits in developing climate adaptation strategies.

Field surveys of larval, pupal and adult *Aedes aegypti*, as well as detailed physical and social household characteristics, were conducted in the summers of 2011 and 2012 at geographic scales from the household to the community along a transect from sea level to 2400 m ASL. These data are being used in models to estimate *Aedes aegypti* habitat suitability. In 2011, *Aedes aegypti* were identified at an elevation of over 2150 m in Puebla, the highest elevation at which this species has been observed.